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## WORLD TB DAY: STEPS TOWARDS ELIMINATION

March 24 has been designated as World TB Day in order to promote awareness, knowledge and motivation for action against tuberculosis (TB) worldwide. This day commemorates the discovery of the TB bacillus on March 24, 1882 by Dr. Robert Koch. At the time, his discovery was the most important step toward the elimination of TB. Despite the many scientific advances in TB surveillance, treatment and prevention, this ancient disease remains a serious global public health threat. Each year, two mil-

lion people die from TB and someone in the world is newly infected every second.

Fortunately the United States does not bear the high TB mortality and morbidity rates as other countries around the world; however TB still remains a significant problem in Tennessee. In 2003, there were 285 reported cases of tuberculosis in Tennessee, a decrease of eight percent from the previous year. While the TB case rates in Tennessee have steadily decreased over the last decade, Tennessee had

the 15<sup>th</sup> highest case rate in 2003.

### Rates of TB among the Foreign-born

There continues to be a significant disparity in the rate of TB in foreign-born (FB) residents compared to U.S.-born residents (31.4 per 100,000 and 4.7 per 100,000, respectively, in 2002). Since 1997, the proportion of TB cases in Tennessee occurring among foreign-born residents has increased from 9 percent to 18 percent (see

*(Continued on page 2)*

## THE CURRENT H5N1 AVIAN INFLUENZA EPIDEMIC

Outbreaks of H5N1 avian influenza in poultry, currently reported in ten Asian countries, are historically unprecedented in their scale, geographic spread, and economic consequences for the agricultural sector. The concerns are that the strain has become endemic in poultry populations of the region and that infection in migratory birds could spread to distant regions.

As of March 10, 2004, the World Health Organization (WHO) had reported 33

confirmed human cases of avian influenza A(H5N1): eleven cases with seven deaths in Thailand and 22 cases and 15 deaths in Viet Nam.

Avian influenza is an infectious disease of birds caused by type A strains of the influenza virus. The disease, which was first identified in Italy more than 100 years ago, occurs worldwide. All birds are thought to be susceptible to infection with avian influenza, though some species are more resis-

tant to infection than others. Infection causes a wide spectrum of symptoms in birds, ranging from mild illness to a highly contagious and rapidly fatal disease resulting in severe epidemics.

### Human Cases

Avian influenza viruses do not normally infect species other than birds and pigs. The first documented infection of humans with an avian influenza virus occurred in Hong Kong in 1997, when the H5N1 strain

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## WORLD TB DAY: STEPS TOWARDS ELIMINATION OF THE DISEASE (CONTINUED)

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Figure 1). During the same period of time, there has been an annual increase of approximately 42% in Hispanic persons receiving services at Tennessee's local health departments. According to the 2000 Census, approximately 160,000 Tennessee residents were born outside of the United States, the majority in TB-endemic countries. In consideration of the growing foreign-born population residing in Tennessee, a statewide Targeted Tuberculin Testing and Treatment Initiative (TTI) has been implemented to address the potential of TB transmission within this and other high-risk groups, whose health directly affects that of the entire population.

In 2001, the Tennessee State Legislature allocated new funding to provide foreign-born persons with tuberculin testing, clinical evaluation, and treatment for TB or latent TB infection (LTBI), and new public health staff were hired to provide these services. The funds also enabled clinic renovations, the purchase of new clinic and laboratory equipment, transportation of patients to clinics, translation and interpretation services, and expanded physician services. Outreach was implemented in local communities to identify and establish a relationship with foreign-born populations that would benefit from TB services.

### Two Arms of the TTI Initiative

Two concurrent arms of the TTI have been developed. The first arm involves ensuring that TB services are provided to foreign-born persons already coming to the local

health departments for other services such as immunizations, prenatal care, STD/HIV treatment or primary care visits. The second arm involves the provision of TB services at community sites where foreign-born persons can be accessed. Specific community sites where TTI services can be delivered include churches or other religious gatherings, factories, grocery stores, restaurants, community centers, and residential sites such as apartment complexes.

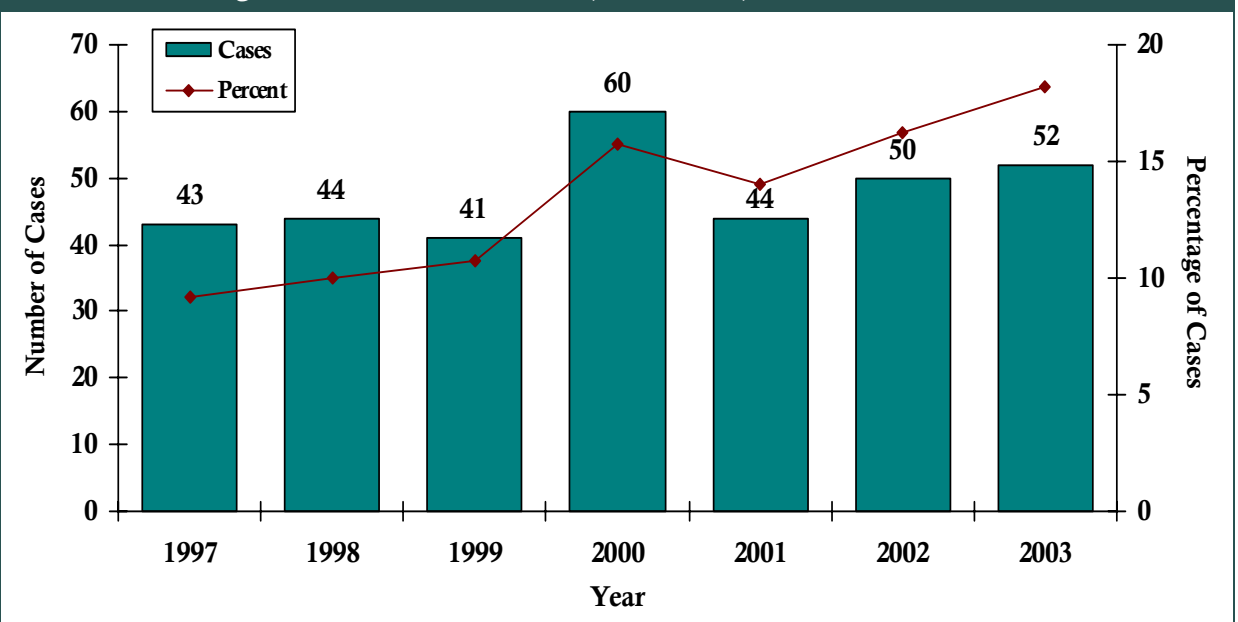
### Success with the Initiative

During the first year of the initiative (March 2002 to February 2003), over 40,000 persons received education and individualized risk assessment for TB and LTBI. Almost 23,000 of the individuals screened and educated were identified as having increased risk for TB infection and subsequently received tuberculin skin testing. Of note, five cases of active TB were detected as a direct result of targeted testing activities. LTBI was diagnosed in 15 percent of all high-risk persons tested, and in 36 percent of foreign-born persons tested. In contrast, only 1 percent of individuals with no TB risk factors were found to have a positive TST, and many of these could represent false-positive results due to environmental mycobacteria. These data indicate that tuberculin

testing programs targeting high-risk populations enable early detection of active TB cases and identification of persons with LTBI who would benefit from treatment. Persons born in TB-endemic areas appear to have the highest rate of TB infection and are thus an appropriate priority group for tuberculin testing and treatment of LTBI. Furthermore, our findings indicate that tuberculin testing of low-risk persons has low yield and thus is not an effective use of limited public health resources. Preliminary results for year two of the TTI are very similar to that of year one. Foreign born individuals continue to have higher positive skin test results than other high-risk individuals and individuals with no risk for TB infection or disease. During 2004, the Tennessee Department of Health will continue to identify, educate and screen high-risk individuals for TB/LTBI, as well as prioritize efforts towards ensuring treatment completion for all patients.

Given the great success of the Tennessee Department of Health's Targeted Testing Initiative, we are optimistic that this statewide initiative will reduce the incidence of active TB among Tennessee residents, particularly the foreign-born. Implementation of this program is thus a big step towards the goal of eliminating TB in Tennessee.

FIGURE 1. Foreign-born Tuberculosis Cases, Tennessee, 1997 - 2003



## THE CURRENT H5N1 AVIAN INFLUENZA EPIDEMIC (CONTINUED)

(Continued from page 1)

caused severe respiratory disease in 18 humans, of whom six died. The infection of humans coincided with an epidemic of highly pathogenic avian influenza, caused by the same strain, in Hong Kong's poultry population.

The good news with this current epidemic is that no spread from one human to another has been documented to date. But if the virus spreads widely among poultry, exposing more people to infection from contact with the birds, the odds will go up that the virus may mutate to become more transmissible among humans.

The real danger is the possibility that ultimately someone will be simultaneously infected with an avian flu virus and a human flu virus, allowing the viruses to swap genes in a way that makes the bird virus highly transmissible among humans, who would have no natural immunity. The odds of that happening will clearly go up as the avian virus spreads more widely among domestic poultry. Avian flu has been reported in birds in at least ten Asian countries so far, several of which were slow to acknowledge the problem and mount vigorous control efforts.

The most prevalent avian virus now circulating in birds (H5N1), has characteristics that could make it troublesome

if it invaded human populations. Although scientists lack enough data to know how virulent it may be, it has caused serious disease and deaths in a high percentage of those known to be infected, and it is resistant to two of the antiviral drugs commonly used against influenza, leaving only the more costly drugs amantadine and rimantadine as potential therapy. Health officials are rushing to prepare a seed virus for vaccine production, but full-scale production could take months.

### Avian Influenza in the US

In early February 2004 avian influenza was found on a poultry farm in Delaware. The outbreak virus was not related to the A(H5N1) virus found in Asia but is not highly pathogenic and has existed in this country for a long time. However, in order to contain the outbreak, thousands of chicken have been slaughtered and farms quarantined.

### Tennessee and Avian Influenza

An epidemic of avian influenza in Tennessee is a low-risk possibility. However, given the nature of the virus, public health officials in the state are urging health care providers to be alert for possible cases. Additionally, the fourth case of severe acute respiratory syndrome (SARS-CoV) has been reported in China, one of the countries first reporting avian influenza in poultry. Both of these diseases are highly infec-

tious, as well as potentially devastating to large numbers of people. Providers need to be aware of a history of travel to Asia for people presenting with respiratory symptoms.

### CDC Recommendations for Testing

Testing for influenza A(H5N1) is indicated for **hospitalized** patients with: (a) radiographically confirmed pneumonia, acute respiratory distress syndrome (ARDS), or other severe respiratory illness for which an alternate diagnosis has not been established, **AND** (b) history of travel within 10 days of symptom onset to a country with documented H5N1 avian influenza in poultry and/or humans (for a listing of H5N1-affected countries, see the OIE Web site at [http://www.oie.int/eng/en\\_index.htm](http://www.oie.int/eng/en_index.htm) and the WHO Web site at <http://www.who.int/en/>).

Testing for influenza A(H5N1) should be considered on a case-by-case basis in consultation with state and local health departments for **hospitalized or ambulatory** patients with: (a) documented temperature of  $>38^{\circ}\text{C}$  ( $>100.4^{\circ}\text{F}$ ), **AND** (b) one or more of the following: cough, sore throat, shortness of breath, **AND** (c) history of contact with domestic poultry (e.g., visited a poultry farm, household raising poultry, or bird market) or a known or suspected human case of influenza A(H5N1) in an H5N1-affected country within 10 days of symptom onset.

<sup>1</sup>[www.who.int/csr/disease/avian/influenza/country/cases\\_table\\_2004\\_03\\_10/en/](http://www.who.int/csr/disease/avian/influenza/country/cases_table_2004_03_10/en/). WHO: Confirmed human cases of avian influenza A(H5N1). Accessed March 12, 2004.

## OUTBREAK OF PHOTOKERATITIS AND "SUNBURN" AFTER FUNDRAISING DINNER

On February 24, 2003 a local health department notified the Tennessee Department of Health that eight persons had reported problems with their eyes after a fundraising event. Initial concerns included the possibility of a chemical exposure; however, an astute ophthalmologist who saw several patients the next morning suggested that clinical findings were consistent with photokeratitis. Photokeratitis is damage to the superficial layer of the eye from ultraviolet (UV) radiation, which

has characteristic clinical findings, including conjunctival injection (redness of the eye) and punctate erosions of the surface of the eye with sparing of areas protected by the eyelids. Photokeratitis is caused by short wavelength UV radiation (e.g., UVB) from natural or artificial sources. The Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC) have received numerous complaints of these injuries associated with damaged mercury-

vapor or metal halide lamps, which are often used to light gymnasiums, factories, and warehouses. In addition, UV radiation in this range can also cause superficial burns to the skin (e.g., sunburn).

The fundraising event took place in a basketball gymnasium on the evening of February 24, and lasted approximately 2-3 hours. An estimated 600 persons attended the event, during

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# OUTBREAK OF PHOTOKERATITIS AND “SUNBURN” AFTER FUNDRAISING DINNER (CONTINUED)

(Continued from page 3)

which they were seated at tables arranged throughout the gymnasium for a catered meal and presentations by several speakers, including a nationally recognized sports figure.

## Cohort Study

A cohort study of persons in the high-risk area of the gymnasium was begun; the goal was to define the tables where most of the affected persons were located. Case finding consisted of identifying and calling all persons at the high-risk tables and at least one representative from all other tables. A case was defined as acute onset of eye redness, burning, and pain within 12 hours of the event in persons who attended the event and who had no eye problems before the event. In addition, a press release urged any affected person to call the Tennessee Department of Health. Medical records were reviewed. The damaged lamp that likely caused the injuries was unavailable.

Of the approximately 600 persons who attended, 18 (~3%) persons were identified who met the case definition for photokeratitis. Of these 18 persons, 13 (72%) also had burns to their face and eyelids. In addition, 2 persons were

identified who had burns to their face without eye symptoms. The median age of persons with photokeratitis was 49 years and 72% were male. The median incubation period was 7 hours. Of the >100 persons contacted, risk was strongly associated with sitting at one of four adjacent tables located in the rear of the gymnasium. The attack rate for persons sitting in this high-risk area was ~50%. Wearing glasses or contact lenses with UV protection reduced the risk.

The gymnasium is lit by 20 metal halide lamps, which hang down several feet from the 24-30 foot ceiling. On February 26, no functioning lamps were identified with broken outer envelopes, however the recommendation was made that all of the lamps in the high-risk area be changed. Two lamps near the high-risk area were noted to be broken off at the metal base and were not functioning. One of the two lamps had been functioning during the dinner and was noted by an employee to have a broken outer envelope after the event. When the employee tried to change the lamp, the remaining parts of the lamp broke off. This lamp was located above where most of the affected persons were seated during the event. Al-

though the lamp was unavailable for inspection, it was likely responsible for the UV-radiation-induced injuries to persons who attended the event.

## Recommendations for Prevention

Because metal halide lamps are considered radiation devices, the FDA regulates some aspects of their manufacture. The high-pressure arc discharge tubes of these lamps emit high doses of short-wave UV radiation (UVB), which are attenuated by the outer glass envelope. It is well established that UV radiation injuries can occur when the outer glass envelope is broken. Therefore, it is recommended that lights be turned off immediately if the outer glass envelope breaks (e.g., hit by ball and glass found on floor). Because these lamps may continue to operate after the outer glass envelope is broken, and the problem might not be recognized promptly, it is recommended that fixtures that completely enclose the lamps with a glass or plastic filter be used in areas where there is potential for damage by flying objects. Wire guards do not protect against UV radiation from damaged lamps. If a fixture is not fully enclosed, it is recommended that self-extinguishing lamps (designated with a “T”) be used.

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